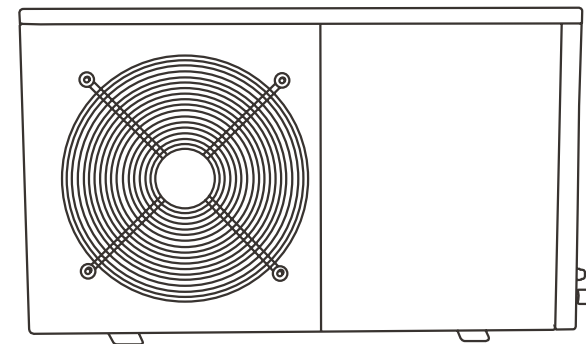




Using Heat Pump Technology Designed Especially for Swimming Pools

SWIMMING POOL HEAT PUMP Service Manual



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1. Specifications
2. Dimension
3. Installation
4. Electrical Wiring
5. Initial Startup of the unit
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This manual includes all necessary information

ATTENTION

- The heat pump unit must be installed by qualified technicians from after-sales center or authorized distributor.
- Operating and maintaining according to recommended time and frequency on the manual.
- Use only standard spare parts.

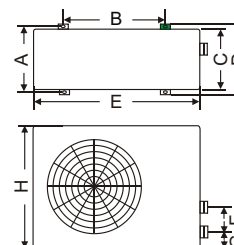
1. Specifications

1.1 Pool Heat Pump (Horizontal , EU design)

Models		XP09Hs	XP12Hs	XP18Hs
* Capacity at +25°C				
Heat Output	KW	8. 7	12	18
Power Consumption	KW	1. 45	2. 0	3. 0
COP		6	6	6
* Capacity at +15°C				
Heat Output	KW	6. 45	9. 0	13. 5
Power Consumption	KW	1. 43	1. 95	3. 0
COP		4. 5	4. 5	4. 5
*Power Supply				
Voltage	V	220-240	220-240	220-240
Rated Current	A	6. 7	9. 3	13. 9
Advised Fuse	A	20	20	35
WATER DATA				
Advised pool volume	m³	25-35	35-55	60-85
Advised water flux	L/min	100	140	170
Water pipe in-out spec	mm	50	50	50
*General Data				
Compressor		Rotary	Rotary	Rotary
Air flow				
*Condenser				
Noise level(10m)	dB(A)	36	37	42
Noise level(1 m)	dB(A)	47	48	54
Water Pressure	Kpa	15	15	16
Refrigerant	kg	1.2	1.3	2.3
*Dimension & Weight				
Net Dimension	mm	930/360/550	1000/360/620	1000/360/855
Net Weight	kg	50	65	95
Packing Dimension	mm	1060/380/600	1065/380/670	1065/380/955
Gross Weight	kg	56	72	105

Above data is subject to modification without notice.

2. Dimension

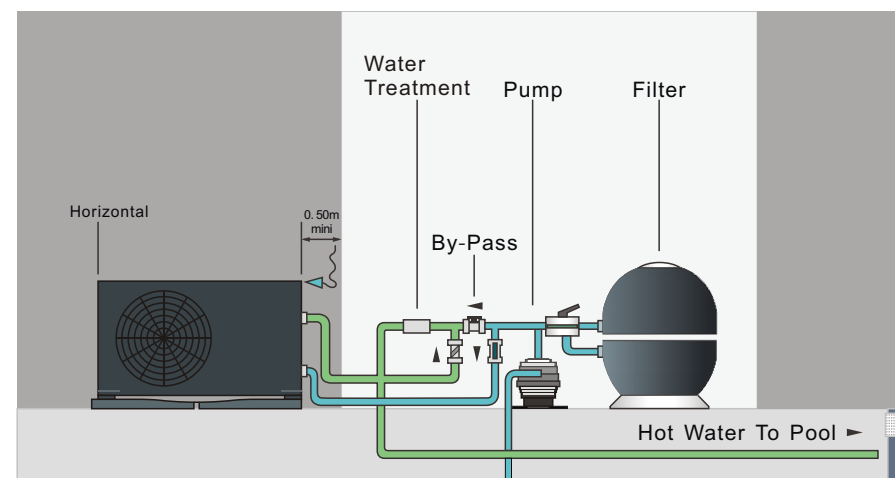


Unit: mm

Models	XP09Hs	XP12Hs	XP18Hs
A	330	330	380
B	680	655	650
C	280	300	360
D	360	360	410
E	930	1000	1000
F	230	340	560
G	83	83	83
H	520	590	820

3. Installation

3.1 Installation illustration



NOTE: The factory only provides the heat pump unit. The other items in the illustration are necessary spare parts for the water system which are provided by users or installers.

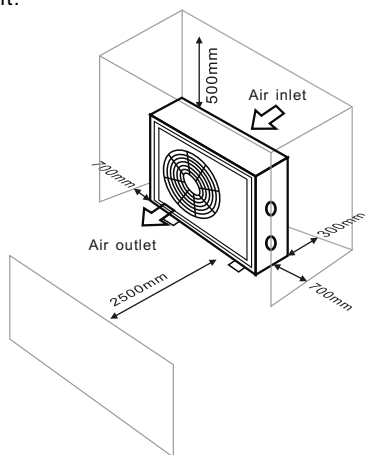
⚠ ATTENTION:

Please follow these steps when operating the first time :

- 1.Open valve and charge water
- 2.Make sure that the pump and the water-in pipe have been filled with water
- 3.Close the valve and start the unit

3.2 Installation

- (1) The unit is designed for outdoor location with good ventilation. Recirculation of cold discharge air back into evaporator coil will greatly reduce heating capacity and efficiency of the unit, which will void the compressor warranty.
- (2) The unit can be installed almost anywhere in the outdoors. To get a good performance ,it needs to meet the three factors :
 - a) Good ventilation
 - b) Stable and reliable power supply
 - c) Recycled water system
 The difference from gas water heater, it should not bring environmental pollution or have the installing problems in-windy areas.
- (3) The unit should not be installed in a limited air ventilation area ,or placed in a bush where it will block the air inlet . These location deny the unit of a continuous source of fresh air . When seasons changing , it may stick leaves on the evaporator coil , thereby reducing its efficiency and impact of its service life .
- (4) When install a bypass, it should be not exceed 30% of nominal flow rate .
- (5) Must make Water level higher than the circulation pump location.
- (6) Below picture show the minimum required distance on each side of pool heat pump unit.



- (7) Typically, the pool heat pump unit should be installed aside the pools, less than 7.5 meters distance. If it is installed farther away, the pipeline system will cause greater heat loss. The most of pipeline are installed under ground , although the pipeline system has to do thermal insulation, but tunnels and the soil around will still occur heat exchange, for example, each 30 meters (15 meters to and from the pump=30 meters total), unless the ground is wet or the water table is high. A very rough estimate of heat loss per 30 meters is 0.6KW per hour (2000BTU) for every 5°C difference in temperature between the pool water and ground surrounding the pipe, which translates to about 3% to 5% increase in run time.

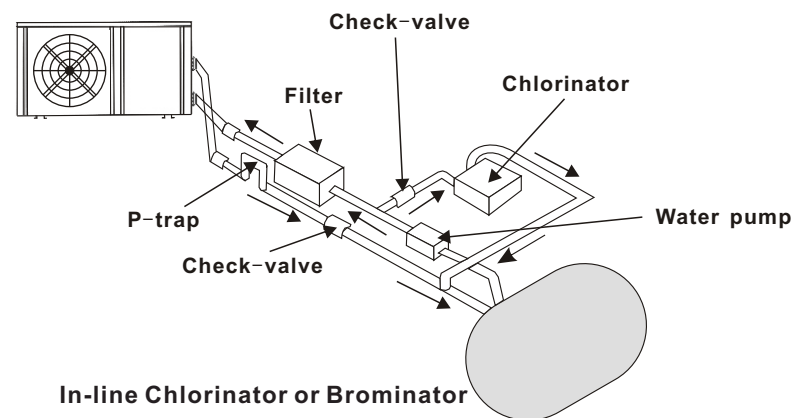
- (8) To get the best heat exchange of heat pump unit, it should be matched the normal rate of water flow recommended in specification sheet.
- (9) It is required to increase the discharge pipe to prevent freezing in cold season, to put T fitting and ball valve to facilitate changing the water in winter or emptying the water out of system to prevent freezing when HP stop operating at the ambient temperature below zero, otherwise the unit may be damaged .
- (10) It is suggested to install the quick adaptor in front of water in-out connection, which could discharge water easily to prevent water freezing, and be convenient for maintenance and service.
- (11) When unit running, there will be some condensation water discharged from the bottom, please hold the drain nozzle (accessory) into the hole and clip well, and then connect a pipe to drain the condensation water out.
- (12) If water pressure is over 10 KPA, or water flow rate is more than 11 cubic meters through heat it is necessary to install the by-pass pipe in water system.

3.3 The location of chemical's instruction to your system is also critical to the heater's life.

If an automatic chlorinator or brominator is used, it must be located downstream of the heater.

A trap must be installed between the chlorinator and the heater to prevent chlorine return into the heat pump. (See below pictures)

Pressure-type Chlorinator or Brominator

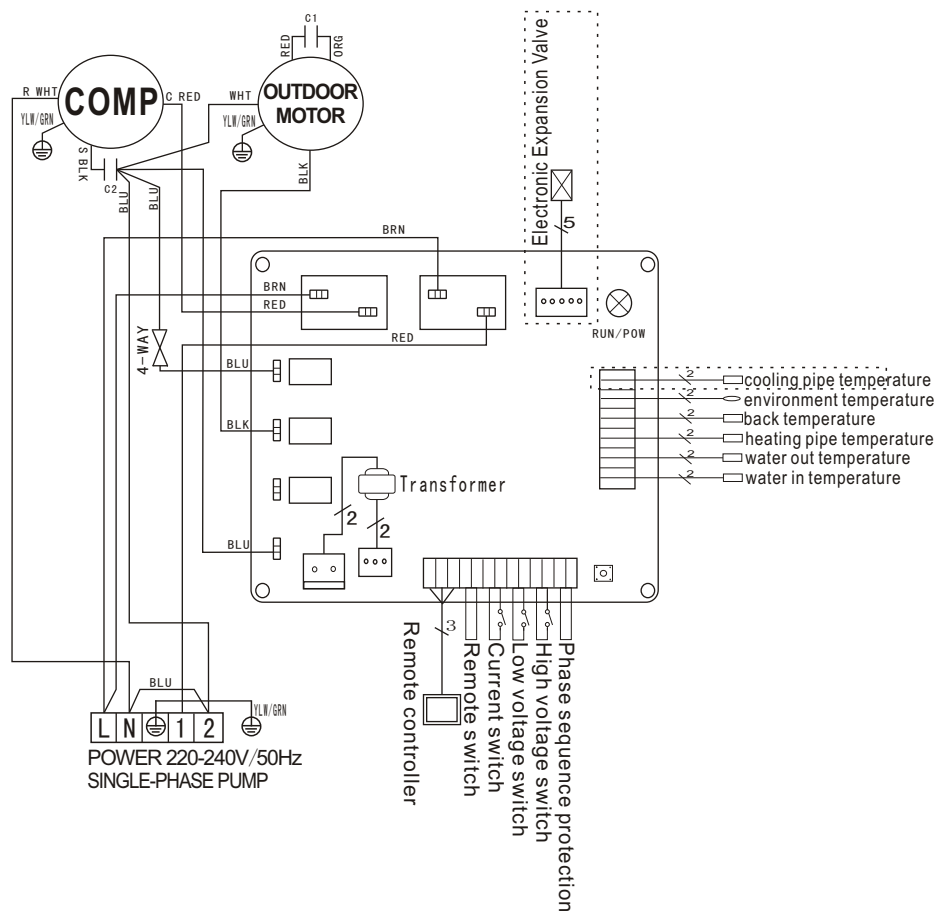


In-line Chlorinator or Brominator

4. Electrical Wiring

4.1 SWIMMING POOL HEAT PUMP WIRING DIAGRAM

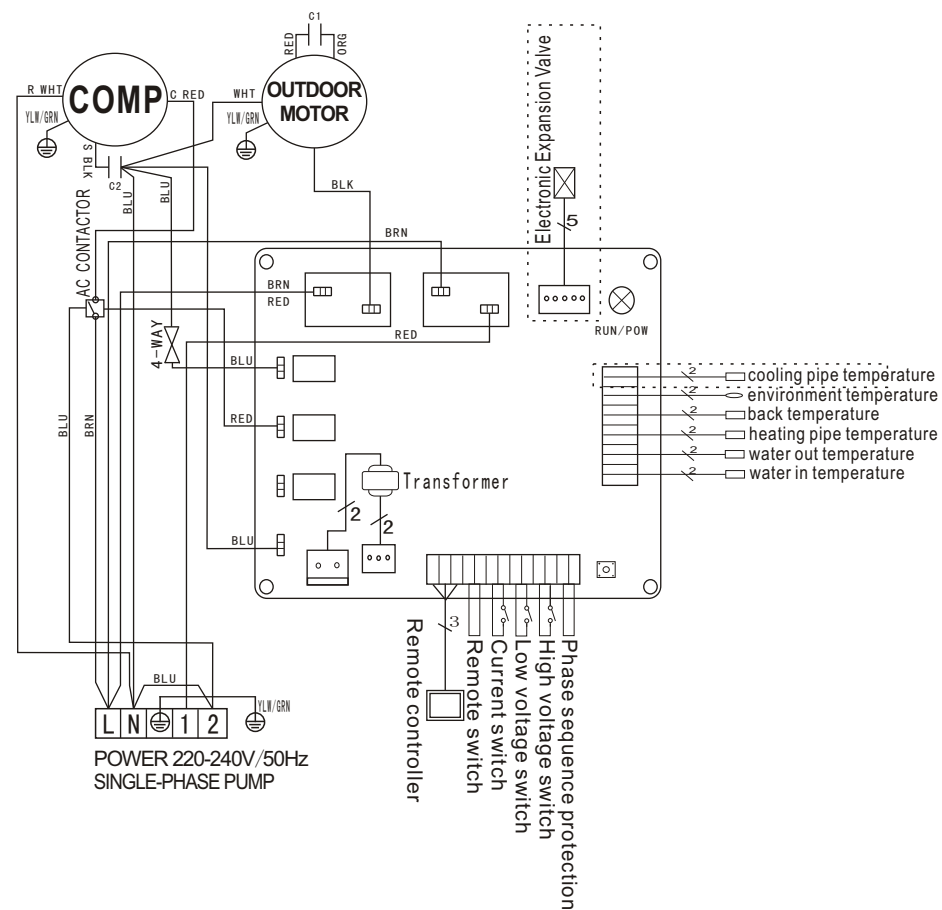
XP09Hs



* The dotted line part are only used in some models

4.2 SWIMMING POOL HEAT PUMP WIRING DIAGRAM

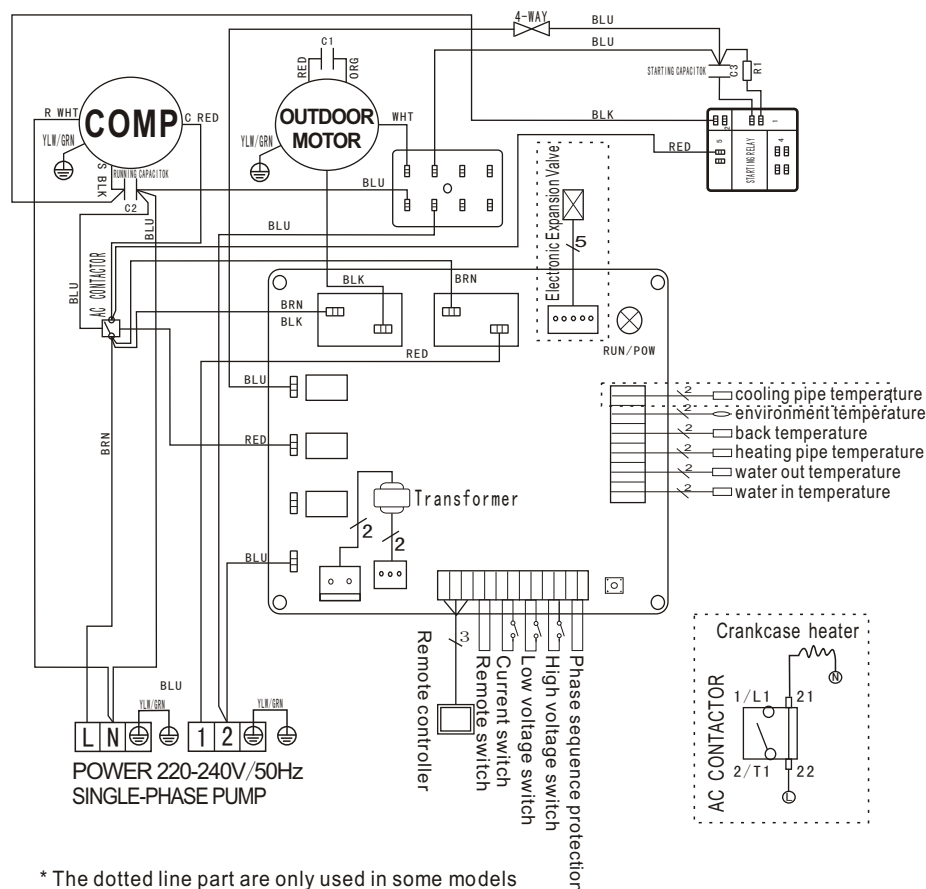
XP12Hs



* The dotted line part are only used in some models

4.3 SWIMMING POOL HEAT PUMP WIRING DIAGRAM

XP18Hs



NOTE:

- (1) Above electrical wiring diagram only for your reference, please subject machine posted the wiring diagram.
- (2) The swimming pool heat pump must be connected ground wire well, although the unit heat exchanger is electrically isolated from the rest of the unit. Grounding the unit is still required to protect you against short circuits inside the unit. Bonding is also required.

Disconnect : A disconnect means (circuit breaker, fused or un-fused switch) should be located within sight of and readily accessible from the unit . This is common practice on commercial and residential heat pumps . It prevents remotely-energizing unattended equipment and permits turning off power at the unit while the unit is being serviced .

5. Initial Startup of the unit

Note: Please make sure the water pump is running in circulation with adequate rate of water flow.

Startup Procedure after Installation is completed, and please follow these steps:

- (1) Turn on your filter pump ,check water leaks and verify flow of swimming pool
- (2) Turn on the electrical power supply to the unit, then press the key ON/OFF of wire controller, it should start in several seconds.
- (3) After running a few minutes make sure the air ventilation from the side (top) of the unit is cooler (Between 5°C and 10 °C)
- (4) When turn off the filter pump, the unit should also turn off automatically, if not, then adjust the flow switch
- (5) Allow the unit and pool pump to run 24 hours per day until the water reaches the desired temperature. When the temperature reaches the setting value, the HP unit will shut down, when the pool temperature drops more than 1°C, please restart (as long as HP unit is running)

Water Flow Switch:

It is equipped with a flow switch for protecting the HP unit running with adequate water flow rate .It will turn on when the pool pump runs and shut it off when the pump shuts off. If the pool water level higher than 1 m above or below the heat pump's automatic adjustment knob, your dealer may need to adjust its initial startup.

Time Delay:

HP unit should be equipped with a 3-minute built-in solid-state re-start delay protection. Time delay control is an integral part of the circuit control, it can eliminate restart cycling and contactor chatter.

The time delay will automatically restart the HP unit approximately 3 minutes after each control circuit interruption. Even a brief power interruption will activate the solid state 3 minute restart delay and prevent the unit from the starting until the 3 minutes countdown is completed.

6. Running Data Setting

▲ ATTENTION:

HP running parameters must be checked after installation and before first used.

When HP is running, LED displays water inlet temperature

When HP is stopping, LED wire controller displays the actual time.

When HP running, the running mode (cooling or heating) and water temp could be changed. Other parameters only changeable when HP stopping.

Parameter	Meaning	Range	Default	Remarks
0	To set the entering water temp. under cooling mode	8-35℃	28℃	Adjustable
1	To set the entering water temp. under heating mode	15-35℃	28℃	Adjustable
2	Entry into defrosting time period	30-90MIN	40MIN	Adjustable
3	Terms of Entry defrosting function	-30℃to 0℃	-7℃	Adjustable
4	Terms of Exit defrosting function	2 to 30℃	13℃	Adjustable
5	Time of Exit defrosting	1 to 12MIN	8MIN	Adjustable
6	Mode : 0 Cool 1 Heat and Cool 2 Heat and cool + auxiliary elec. heating 3 Heat	0-3	3 (Heat)	Adjustable
7	Mode selection of Electronic expansion valve	0-1	1 (auto)	Adjustable
8	Superheat for heating target	-15℃-15℃	3℃	Adjustable
9	Superheat for cooling target	-15℃-15℃	10℃	Adjustable
A	Manual adjustment steps of electronic expansion valve	18-94	70	Adjustable
b	Inlet water temperature	-9-99℃		Exact testing by value
C	Outlet water temperature	-9-99℃		Exact testing by value
d	Condenser temperature under heating mode	-9-99℃		Exact testing by value
E	Gas return temperature	-9-99℃		Exact testing by value
F	Ambient temperature	-9-99℃		Exact testing by value
G	Condenser temperature under Cooling mode	—		
H	Actual steps of electronic expansion valve	N*5		Exact testing by value

Remarks :

- (1) When HP stop running in 30 seconds ,water pump will shut off automatically.
- (2) LED wire controller can operate the water pump after connected additional cable to the pump device in the position of “PUMP” terminal accurately .
- (3) It is necessary to put an extra 3-phase transfer device for 3 phase water pump.

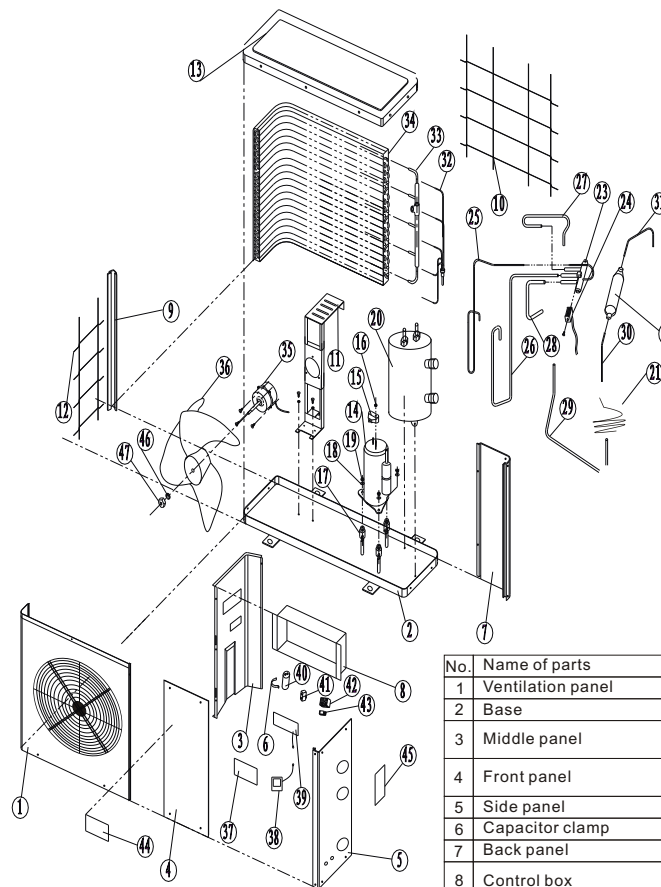
7.1 Error code display on LED wire controller

Malfunction	Wire Controller	Reason	Solution
Inlet water temperature sensor failure	PP1	The sensor in open or short circuit	Check or change the sensor
Outlet water temperature sensor failure	PP2	The sensor in open or short circuit	Check or change the sensor
Heating condenser sensor failure	PP3	The sensor in open or short circuit	Check or change the sensor
Gas return sensor failure	PP4	The sensor in open or short circuit	Check or change the sensor
Ambient sensor failure	PP5	The sensor in open or short circuit	Check or change the sensor
Temperature difference between water inlet and outlet is too much	PP6	Water flow volume not enough, water pressure difference is too low	Check the water flow volume, or water jammed or not
Cooling outlet water temperature is too low	PP7	Water flow volume is not enough	Check the water flow or water system is jammed or not
First grade antifreeze protection in Winter	PP7	Ambient temperature or water inlet temperature is too low	Water pump will run automatically for first grade antifreeze
Second grade antifreeze protection in Winter	PP7	Ambient temperature or water inlet temperature is too low	Heat pump will start heating for second grade antifreeze
Cooling condenser sensor failure	PP8	The sensor in open or short circuit	Check or change the sensor
High pressure protection	EE1	1. Refrigerant is too much 2. Air flow is not enough	1. Discharge redundant refrigerant from HP gas system 2. Clean air exchanger
Low pressure protection	EE2	1. Refrigerant is not enough 2. Water flow is not enough 3. Filter jammed or capillary jammed	1. Check if there is any gas leakage , re-fill the refrigerant 2. Clean air exchanger 3. Replace the filter or capillary
Flow switch failure	EE3	No water/little water	Check the water flow volume ,water pump is failure or not
Power supply connections wrong (for 3 phase unit)	EE4	Wrong connection or lack of connection	Check connections of power cable
Inlet and outlet water temperature difference malfunction	EE5	Water flow volume is not enough, water pressure difference is too low	Check the water flow rate ,or water system is jammed or not
Communication failure	EE8	Wire connection is not good	Check the wire connection

7.2 Other Malfunctions and Solutions (No display on LED wire controller)

Malfunctions	Observing	Reasons	Solution
Heat pump is not running	LED wire controller no display	No power supply	Check cable and circuit breaker if it is connected.
	LED wire controller displays the actual time	Heat pump under standby status	Startup heat pump to run
	LED wire controller displays the actual water temperature	1. water temperature is reaching to setting value, HP under constant temperature status 2. heat pump just start to run 3. under defrosting	1. verify water temperature setting 2. Startup heat pump after a few minutes 3. LED wire controller should display "Defrosting"
Water temperature is cooling when HP runs under heating mode	LED wire controller displays actual water temperature and no Error code displays	1. choose the wrong mode 2. figures show defects 3. controller defect	1. adjust the mode to proper running 2. replace the defect LED wire controller, then check the status after changing the running mode, verifying the water inlet and outlet temperature 3. replace defect main controller
Short running	LED displays actual water temperature, no Error code displays	1. fan NO running 2. air ventilation is not enough 3. Refrigerant is not enough	1. Check the cable connections between the motor and fan, if necessary, it should be replaced. 2. Check the location of heat pump unit, and eliminate all obstacles to make good air ventilation 3. Replace or repair the heat pump unit
Water stains	Water stains on heat pump unit	1. concreting 2. water leakage	1. No action 2. check the titanium heat exchanger carefully if it is any defect
Too much ice on evaporator	Too much ice on evaporator	1. air ventilation is not enough 2. refrigerant is not enough	1. check the location of heat pump unit, and eliminate all obstacles to make good air ventilation 2. replace or repair the heat pump unit

8. Exploded Diagram



No.	Name of parts	No.	Name of parts
1	Ventilation panel	25	Air discharge pipe
2	Base	26	Air suction pipe
3	Middle panel	27	Titanium pipe to 4-way valve E
4	Front panel	28	4-way valve C to Condenser air collecting pipe
5	Side panel	29	Capillary to liquid separator
6	Capacitor clamp	30	Filter to Capillary
7	Back panel	31	Filter to titanium pipe
8	Control box	32	Subassembly of Liquid separator
9	Back support pole	33	Subassembly of air collecting pipe
10	Back net	34	Condenser
11	Motor bracket	35	Fan motor
12	Side net	36	Fan blade
13	Top cover	37	Wiring diagram
14	Compressor	38	Control board
15	Compressor cover	39	Controller
16	Nut	40	Compressor capacitor
17	Shockproof gasket	41	Fan capacitor
18	Compressor feet gasket	42	Wiring terminal
19	Nut	43	Wire clamp
20	Titanium in PVC	44	Logo
21	Capillary	45	Label
22	Filter	46	Spring washer
23	4-way valve	47	Nut
24	Wiring of 4-way valve		